

REMARKS

Claims 1-14 were considered. Claims 1-4 are amended. Previously withdrawn claims 15-24 are canceled. Claims 1-14 remain in the Application.

The Patent Office rejects claims 1-6 under 35 U.S.C. § 103(a). Reconsideration of the pending claims is respectfully requested in view of the above amendments and the following remarks.

A. 35 U.S.C. §103(a): Rejection of Claims 1 & 5-6

The Patent Office rejects claim 1 and 5-6 under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,812,509 of Xu (Xu) in view of U.S. Publication No. 2004/0209420 of Ljungcrantz et al. (Ljungcrantz) and U.S. Patent No. 6,878,980 of Gudesen et al. (Gudesen).

Claim 1 discloses a method comprising placing a substrate with a ferroelectric polymer layer formed thereon in a chamber, and sputtering a metal layer on the ferroelectric polymer layer in the presence of a flux reducer.

Xu is cited for placing a substrate with a ferroelectric polymer layer formed thereon and sputtering a metal layer on the ferroelectric polymer layer.

It would not have been obvious to one of ordinary skill in the art as of the filing date of the Application to place a substrate with a ferroelectric polymer layer formed thereon in a chamber, as claimed along with sputtering a metal layer on the ferroelectric polymer layer, in the method of claim 1. Ljungcrantz discloses placing a substrate and a ferroelectric layer in a vacuum chamber, and providing a high-purity evaporation source in an effusion cell, as interconnected parts of the chemical process of vacuum evaporation. (See Ljungcrantz at page 2, [0013].) There is thus no teaching or suggestion provided in Ljungcrantz for a method of placing a substrate with a ferroelectric polymer layer formed thereon in a chamber in the context of the physical process of sputtering.

Gudesen does not disclose a method of sputtering a metal layer in the presence of a flux reducer. Gudesen discloses using a low thermal input flux in conjunction with vapor deposition

in order to avoid build-up of thermal energy. (See col. 14, lines 48-56 of Gudesen.) This addresses the temperature, but not the flux, at which the metal is sputtered. (See Application at page 4, paragraph [0018].) Thus, it is not clear in Gudesen whether the flux is adjusted at all. Further, it is not clear that Gudesen teaches the use of a low thermal input flux in order, as the Patent Office asserts, to improve fatigue resistance, even though Gudesen's invention concerns a memory circuit with improved fatigue resistance.

Therefore, there exists no motivation to combine the references of Xu, Ljungcrantz, and Gudesen as to teach or suggest the elements of claim 1.

Claims 5-6 depend from claim 1 and therefore contain all the limitations of that claim. For at least the reasons stated above with respect to their independent claim, claims 5-6 are not obvious over Xu in view of Ljungcrantz and Gudesen.

For the above stated reasons, Applicants respectfully request that the Patent Office withdraw the rejection to claims 1 and 5-6 under 35 U.S.C. § 103(a).

B. 35 U.S.C. §103(a): Rejection of Claims 2-4

The Patent Office rejects claims 2-4 under 35 U.S.C. § 103(a) as obvious over Xu in view of Ljungcrantz and Gudesen, and further in view of U.S. Patent No. 6,582,569 of Chiang et al. (Chiang).

Claims 2-4 depend from claim 1 and therefore contain all the limitations of that claim. For at least the reasons stated above with respect to its independent claim, claims 2-4 are not obvious over Xu in view of Ljungcrantz and Gudesen, because the cited references do not teach or provide any motivation for sputtering a metal layer on a ferroelectric polymer layer in the presence of a flux reducer.

Further, claim 2 includes the method of claim 1, wherein sputtering comprises sputtering in the presence of a collimator. The method of claim 2 would not have been obvious to one of ordinary skill in the art at the time the invention was made. Although Chiang refers to sputtering in the presence of a collimator (col. 3, lines 22-29), it is mentioned as one approach in the background art for ameliorating the problem of overhangs of copper forming around the upper

corners of a hole into which the copper is to be deposited (col. 2, line 65 to col. 3, line 12), and not particularly for the purpose, as the Patent Office asserts, of providing electrical connections between a large number of active semiconductor devices. Significantly, Chiang dismisses the approach of sputtering in the presence of a collimator because collimators reduce the flux of sputter particles reaching the wafer, a characteristic that Chiang considers to be disadvantageous for purposes of Chiang's patent. (See col. 3, lines 27-45.) A collimator is in fact provided as an example of a flux reducer (Application at page 4, paragraph [0018]), and the flux reducer is used, for example, to modulate the degradation of the ferroelectric polymer layer during a sputter deposition process (Application at page 5, paragraph [0019]). Chiang therefore actually teaches away from the method of sputtering in the presence of a collimator, as disclosed in claim 2.

Further, Chiang does not disclose a method of sputtering a metal layer at a pressure less than approximately 10 milliTorr on a ferroelectric polymer layer, as required by claim 3. The copper layers (150, 180) referred to in Chiang are formed above a layer (24) constituting a barrier between the copper above and the dielectric layer below. (See Chiang at col. 2, lines 2-4 and 40-42.) It is therefore not clear from Chiang what pressure would be used for sputtering on a ferroelectric layer.

Claim 4 is neither disclosed nor motivated by Chiang, under an argument analogous to the one stated above with respect to claim 3.

For the above stated reasons, Applicants respectfully request that the Patent Office withdraw the rejection to claims 2-4 under 35 U.S.C. § 103(a).

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: 6/28/05

William T. Babbitt
William Thomas Babbitt, Reg. No. 39,591

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025
(310) 207-3800

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Nedy Calderon 6/28/05
Nedy Calderon Date